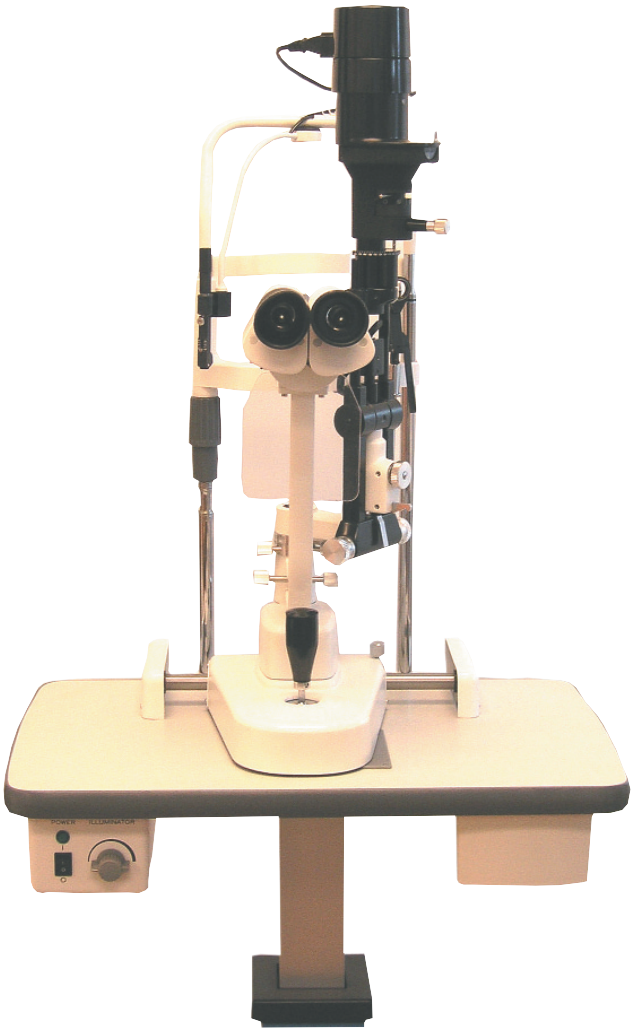

SLIT LAMP
USER'S MANUAL

EQ-6700

AMCON The Eyecare Supply CENTER®

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CONTENTS

Disclaimer and General Safety Warnings **2**
Nomenclature **3**
Assembly **5**
Components 6
Assembly Procedure 7
Checking Procedure After Assembling 10
Operation Procedures **11**
Diopter Compensation and Pupil Distance Adjustment 11
Patient Position and Fixation Target 12
Base Operation 12
Changing the Aperture and Slit Height 13
Maintenance **16**
Replacing the Illumination Bulb 16
Replacing the Reflecting Mirror 16
Replacing the Fuse 17
Replacing the Chin Rest Paper 17
Adjusting the Tightness of the Slit Width Knob 17
Adjusting the Inclination of the Illumination Part 17
Cleaning 17
Protecting 18
Troubleshooting Guide **19**
Transportation and Storage **20**
Specifications **20**

DISCLAIMER

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***NOTE**: Neither Manufacturer nor distributor assumes any responsibility or liability for any damages caused by negligence or ignorance of precautions in this manual.*

GENERAL SAFETY WARNINGS

Follow the proceeding Warnings to avoid injury and damage to the slit lamp.

WARNINGS

1. Avoid flammable or explosive environments, dust, or high temperatures. For indoor use only. Keep the slit lamp clean and dry.
2. Check that all wires are correctly and firmly connected before using. Ensure that the instrument is well grounded.
3. Pay attention to all the rated values of the electrical connecting terminal.
4. Use only a fuse with the specifications and rated values stipulated by the product.
5. Use the supplied power cable with this instrument.
6. Do not touch the surface of the lens or prism with the hand or any hard object.
7. Turn off the main power first before replacing the illumination bulb and fuse.
8. To prevent the instrument from falling, it should be placed on a surface with an inclination angle of less than 10°.
9. Turn off the power and cover the instrument with a dust cover when not in use.
10. In case of a problem, please refer to the troubleshooting guide.

NOMENCLATURE

1. **Joystick --** Incline joystick to move the instrument slightly on the horizontal surface and rotate it to adjust the elevation of the microscope.
2. **Base Locking Screw --** Locks the base when fastened.
3. **Rail Cover --** Protects the rail surface.
4. **Base --** Supports the microscope and the illumination arms with the joystick.
5. **Work Table**
6. **Accessory Drawer --** Storage for the focusing test rod and other accessories.
7. **Brightness Control Switch --** Controls three levels of illumination – H (high), N (normal), and L (low). Avoid working continuously at the high setting as the service life of the bulb will be shortened.
8. **Main Power Switch**
9. **Pilot Lamp**
10. **Microscope Arm Locking Knob --** Locks the rotational movement of microscope arm.
11. **Angle Mark Ring --** Marks the ring of the illumination arm (which relate to the long mark of the microscope) that represents the angle of the two arms.
12. **Chin Rest Elevation Adjustment Knob --** Rotating the knob adjusts the elevation of the chin rest.
13. **Location Roller --** When in the middle, it represents the included angle of 0° between the microscope arm and the illumination arm. When moved to the right or left, the angle is 10°.
14. **Microscope and Illumination Arm Couple Bolt --** Fastening this bolt allows the illumination arm and the microscope arm to move and rotate together. When loosened, the illumination arm can be rotated separately.
15. **Hruby Lens Guide Plate --** Can also be used as an assembly plate for the applanation tonometer.
16. **Breath Shield**
17. **Chin Rest**

18. **Magnification Selection Dial –** Turn to select the desired of five different magnifications of the microscope.

19. **Prism Box** – Separate to adjust pupillary distance.

20. **12.5x Eyepiece**

21. **Microscope Fixation Screw**

22. **Applanation Tonometer Mount** – Optional Applanation Tonometer (EQ-6703) mounts here (sold separately).

23. **Horizontal Mark** – This serves as a guide to ensure proper chin rest height for each patient. The patient's outer canthus should be level with this mark.

24. **Forehead Strap**

25. **Diffusion Lens** -- Used for enlarging illumination field

26. **Lamp Cap**

27. **Slit Height and Aperture Display Window**

28. **Filter Selection Lever --** Switches before four filters.

29. **Horizontal Mark** -- When the patient's lateral canthus is in line with this mark, the elevation of the microscope is controlled by the joystick in the center position.

30. **Fixation Target --** Two fixation targets are available, the diopter adjustment target and the illuminated fixation spot.

31. **Reflecting Mirror --** Both long and short reflecting mirrors are provided. The long mirror is routinely used for most examination procedures. The short mirror is used when the long mirror interferes with observation, such as during funduscopy.

32. **Hruby Lens --** Used for observation of the fundus and the posterior segment of the vitreous body.

33. **Hruby Lens Holder**

34. **Centering Knob --** Loosening this knob allows the illumination light to be moved from the center of the visual field for indirect retroillumination. Fastening the knob brings the illumination light back to the center.

35. **Slit Width Control Knob --** The slit width is adjustable within the rage from 0 to 9mm. The marks on the left knob stand for the approximate width of the slit.

36. Illumination Inclination Lever -- Four 5° inclination stops are available, up to 20°.

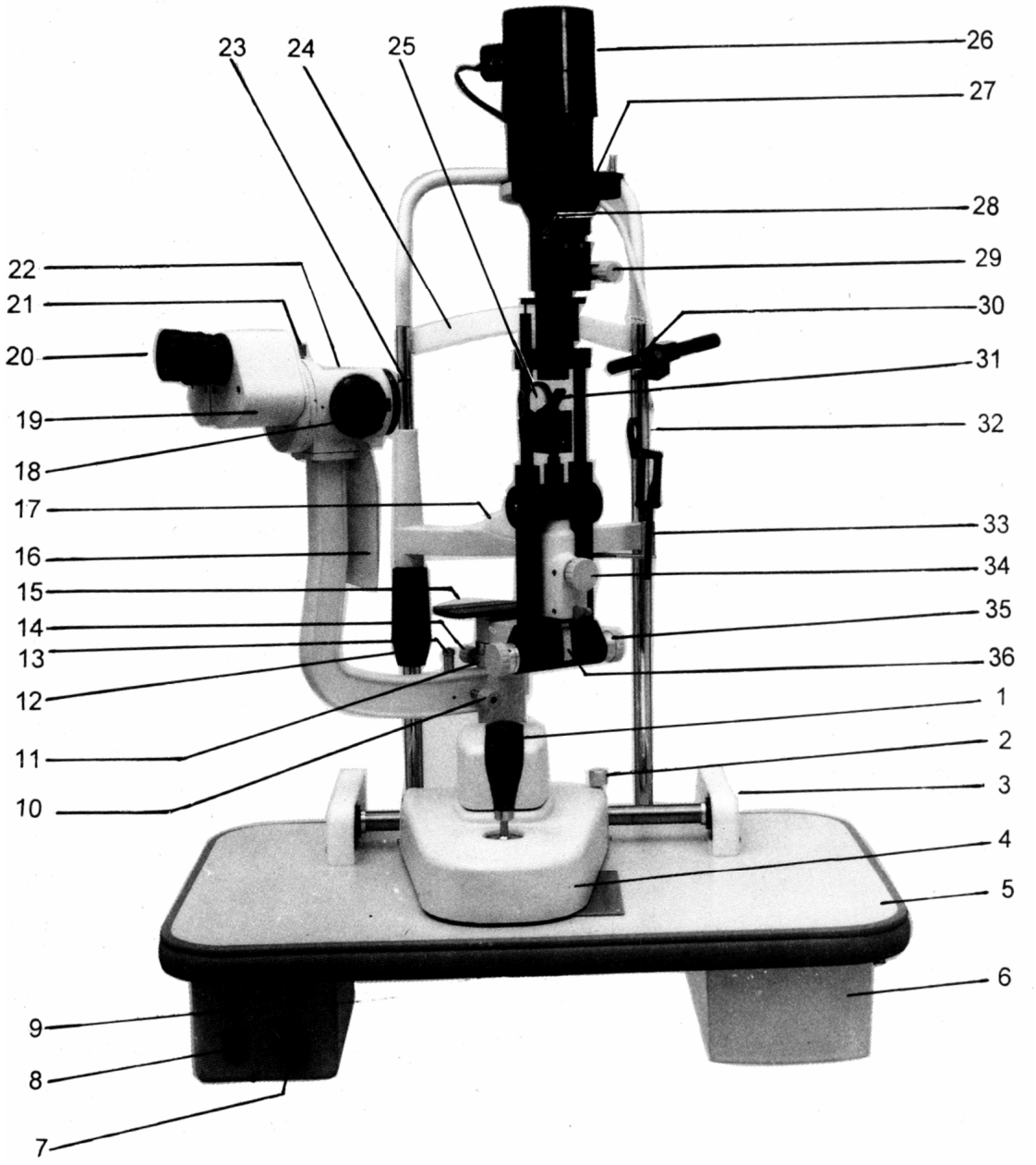

Figure 1

ASSEMBLY

This section of the manual describes how to assemble the slit lamp. All parts should be taken out of the packing case with great care before assembling.

Components

	Name	Qty
A	Illumination Part	1
B	Converging Binocular Tubes	1
C	Base Part	1
D	Heat Rest Part	1
E	Breath Shield	1
F	Work Table with Power Box	1
G	Rail Cover	2
H	Input Power Cable	1
I	Hruby Lens	1
J	Hruby Lens Guide Plate	1
K	Spare Main Illumination Bulb (BT-6705)	2
L	Chin Rest Paper (JZ-7902)	1
M	Focusing Test Rod	1
N	Protection Cap	2
O	Dust Proof Cover	1
P	Fixation Target	1
Q	Spare Long Reflecting Mirror	1
R	Spare Short Reflecting Mirror	1
S	Brush	1
T	Spare Fuse	2
U	Phillips Screwdriver with Wood Handle	1
V	Large Optical Screwdriver	1
W	Small Optical Screwdriver	1
X	Wrench	1

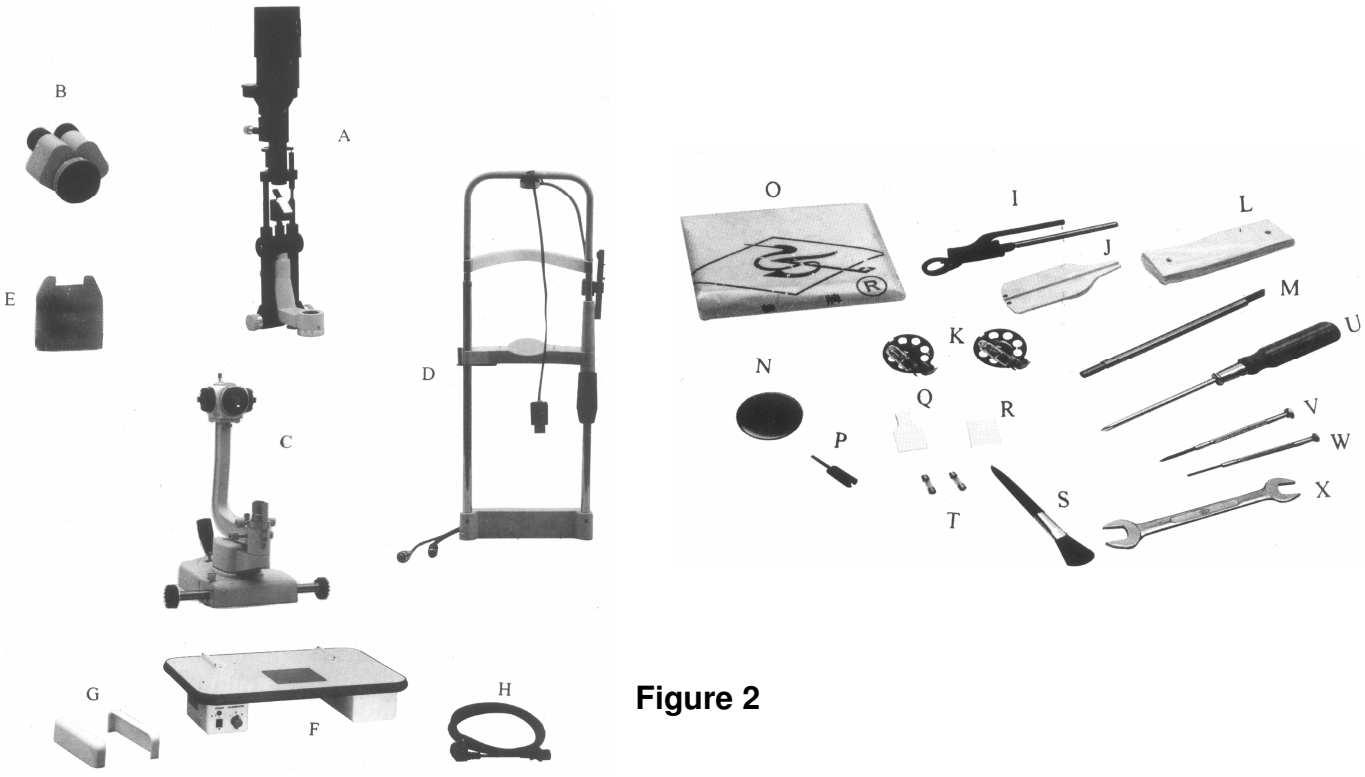

Figure 2

Assembly Procedure

Necessary tools for assembly: Phillips Screwdriver with wood handle (U), Optical Screwdriver (V, W), and Wrench (X)

Selecting Voltage and Fuse

Check the setting on the voltage selector located on the bottom of the power box (Fig. 3). If it does not match with the input voltage, slide it to the proper position with screwdriver (V). Open the fuse holder with screwdriver (U) and take out the fuse. Ensure that its rated value is corresponding to the mains voltage 220V, 0.5A. It has been set to 220v before leaving the factory.

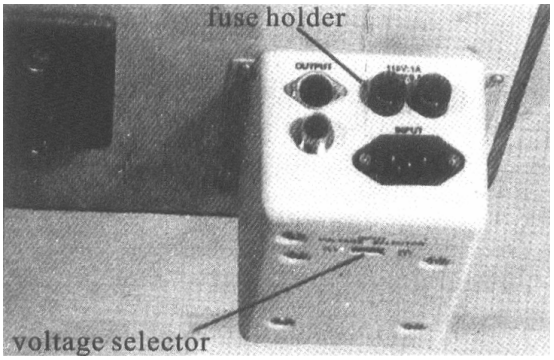

Figure 3

ATTENTION! Set the input voltage and frequency according to that of the mains.

Attaching the Worktable (F)

To attach the work table onto a motorized work table or exam lane arm, please screw off four 8x20mm bolts with spring washers using the wrench (X). Lift the work table to aim its screw hold at the assembly hole of the instrument table. Put down the work table with the power panel facing the operator, and then refasten the bolts securely with wrench.

Assembling the Head Rest (D)

Remove four screws attached to the chin rest connection board with the screwdriver (U). Put two cables in the cap between the head rest fixation plate and the chin rest connection board (Fig. 4). While ensuring that they are not clamped, retighten the previously removed screws.

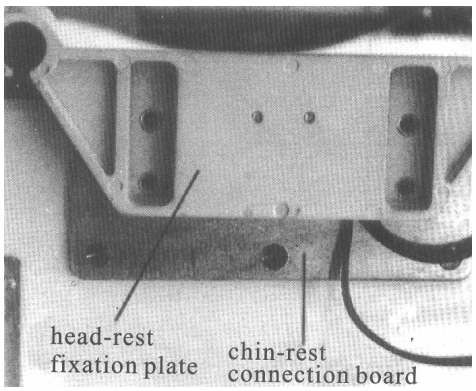

Figure 4

Assembling the Base Part (C) and the Rail Covers (G)
Place the wheels of both sides of the base (C) on the rail on the work table. Check whether the wheels can be rolled steadily on the rail. Remove four screws attached to the rail with the screwdriver (U). Place the rail cover (G) to the rail; retighten the previously removed screws.

Assembling Illumination Part (A)
Loosen the illumination arm couple bolt (14). Rotate the brass shaft sleeve to make an approximate angle of 30-90° between the red mark and the limiting board (Fig. 5).

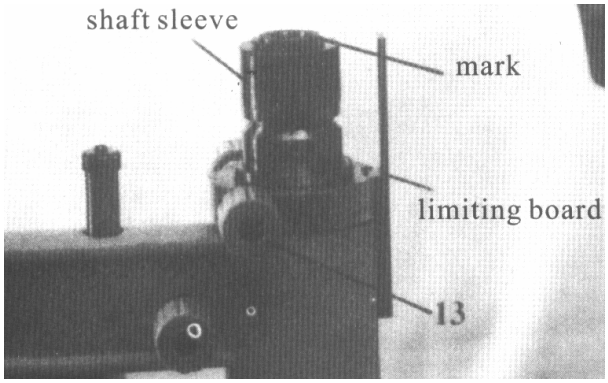

Figure 5

Loosen the set screws in the illumination arm with the screwdriver (V). Aim the assembly hold of the illumination arm at the brass shaft sleeve with care, and then put it down. Keep the shaft close to the bottom surface well and simultaneously stretch the two red marks to one line. After the two red marks are accurately aligned, retighten the set screws (Fig. 6).

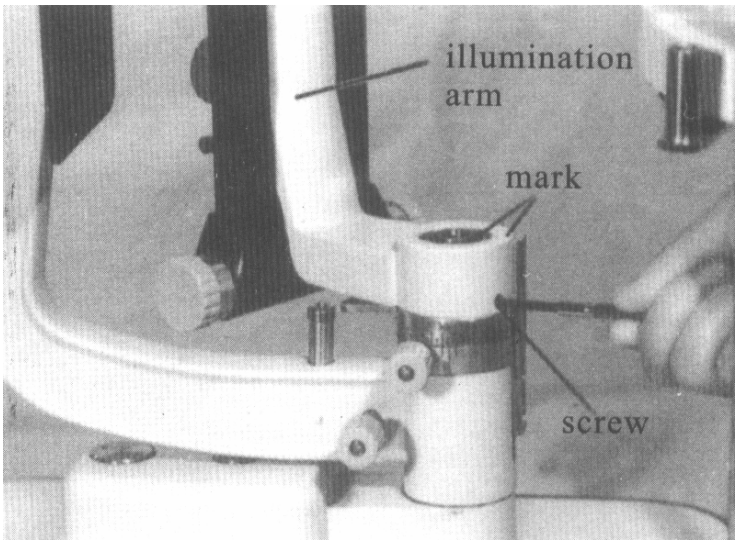

Figure 6

Assembling the Microscope (B)
Match the groove on the binocular tubes with the pin on the microscope body (Fig. 7). Fasten the fixation screw with the big screwdriver to fix the microscope.

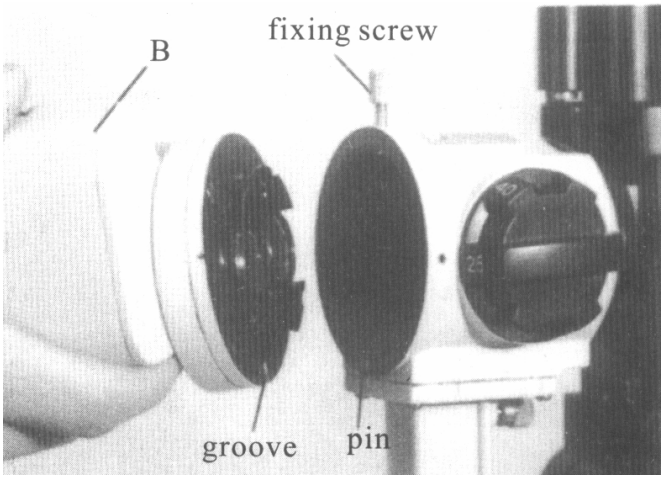

Figure 7

ATTENTION! Avoid touching any lens surface.

Assembling the Breath Shield (E)
Remove the breath shield fixation screw from the microscope arm. Pass the removed screw through the hold of the breath shield then rescrew it into the arm.

Connecting the Plug
Peel off the tape attached to the lamp cap, which ensures that the cap is tightened to the lamp base during shipping. Insert the plug on the top of the head rest part (D) into the socket of the lamp cap (26) on the illumination part (A). Connect the two plugs below the head rest part with the corresponding output socket of the power box. Insert the plug of the input power cable (H) into the input socket of the power box. Remove the cable clips from the bottom of the work table with screw driver (U) and wrap the output and input cables respectively, then reattach then to the bottom of the work table.

Assembling the Hruby Lens (I) and the Hruby Lens Guide Plate (J)
Insert the Hruby lens (I) into the Hruby lens holder (35) on the head rest. Be careful not to touch the lens surface (Fig. 8). Place the Hruby lens guide plate (J) into the main shaft hold of the base part with the small end pointing to the head rest.

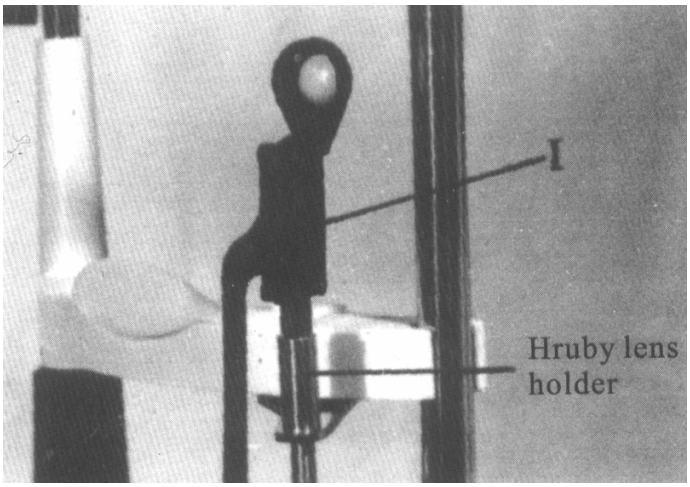

Figure 8

Assembling the Chin Rest Paper (L)
Pull out the two fixing pins from the chin rest. Discard the paper package and allow the pins to go through the holes. Insert the fixing pins into the hole again. Replacement chin rest papers (JZ-7902) can be purchased from Amcon.

Storing Spare Parts
Some spare parts could be stored in the accessory drawer (6).

Checking Procedure After Assembling

Power Plug
This instrument supplies a three wire cable. Please select a proper power socket as matched. Ensure that the instrument is well grounded.

ATTENTION! Please use the special cable supplied with this instrument.

Power Box and Illumination Part
When the main power switch (8) of the power box is placed at 'I', it turns on, and at 'O' it turns off. The main power switch should be set at the 'O' position before connecting the input cable with the power socket. Turn off the main power switch, and the pilot lamp (9) will be lighted. Open the slit width control knob (35) to examine the illumination. Rotate the brightness control switch (7) respectively at three positions and the brightness should be changed accordingly. Check the fixation target device to confirm it is lighting. Check whether all the moveable parts such as aperture and slit height control knob (29), filter selection lever (28), and magnification lever (18) etc. could be operated freely. After examining, turn off the main power and cover the instrument with the dust proof cover (O).

OPERATION PROCEDURES

Diopter Compensation and Pupil Distance Adjustment

Use of the Focusing Test Rod (M)
The rod is supplied as one of the standard accessories for confirming the microscope's accurate adjustment. Insert it into the main shaft hold with the flat surface facing the objective lens, the direction of the operator (Fig. 9).

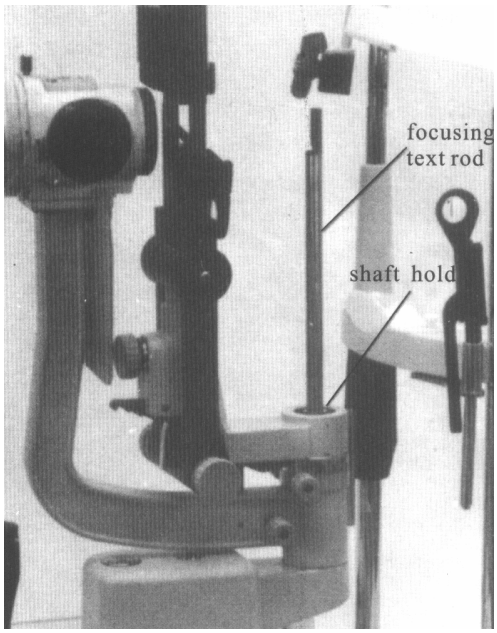

Figure 9

ATTENTION! After adjusting, remember to take out the rod and insert the protection cap.

Brightness Adjustment
Switch on the main power switch and set the brightness control switch (7) at 'N' position. Turn the slit width control knob (35) to make the slit width 2-3mm.

Diopter Compensation
The focus of the microscope is calibrated for an emmetropic user. If the operator has uncorrected refractive error, the eyepiece should be adjusted to the proper power.

To adjust the eyepieces:

- Rotate the diopter adjustment ring (19) counterclockwise all the way.
- Rotate the ring clockwise until a sharp slit image appears on the focusing text rod.
- Adjust the other eyepiece in the same manner.
- Record the diopter value on each eyepiece for future reference.

Pupil distance adjustment
Separate the prism box of the microscope with both hands to adjust the PD until both eyes can see the same image on the focusing test rod through the eyepieces. A stereo view will be seen.

ATTENTION! While adjusting the PD, ensure that both eyepieces are at the same height.

Patient Position and Fixation Target

Positioning the Patient's Head
Have the patient place his chin on the chin rest (17) and his forehead against the head rest belt (24). Adjust the chin rest elevation adjustment knob (12) below the chin rest until the patient's canthus aligns with the horizontal mark (23).

Use of the Fixation Target
For fixing the patient's eyesight, instruct him to look at the fixation target (30). To change fixing position, move the lamp bar and move the curved lever around the forehead. The fixation target with diopter compensation supplies a dot and concentric circles target. Slide the knob to adjust the diopter compensation within the range of –15D to +10D. The fixation target with spot light is used for the patient whose refractive error exceeds –15D. When changing, loosen the fixation screw, replace the fixation target with the spot light source, and refasten with fixation screw (Fig. 10).

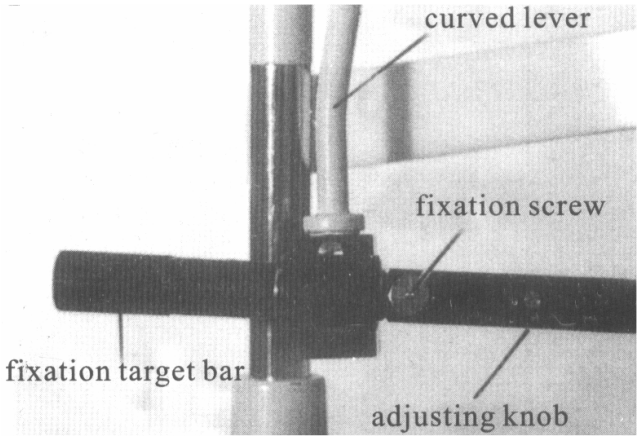

Figure 10

Base Operation

Horizontal Rough Adjustment
Keep the joystick (1) erect and move the base (4) to make the microscope move on the horizontal surface to aim at the object roughly (Fig. 11).

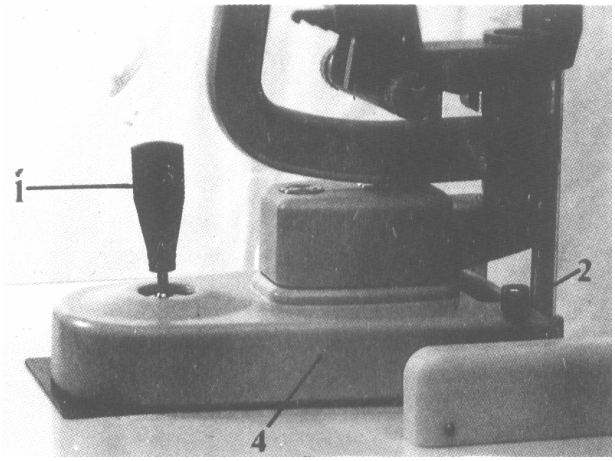

Figure 11

Vertical Adjustment
Rotate the joystick to adjust the microscope height until it aligns with the target. Turn the joystick clockwise to raise the microscope and counterclockwise to lower it.

Horizontal Adjustment
Tilt the joystick to make the microscope move slightly on the horizontal surface. While looking through the eyepieces, tilt the joystick to aim accurately at the object for a sharp image.

Locking the Base
When finishing the adjustment, fasten the base locking screw (2) to lock the base (4) to prevent it from sliding.

Changing the Aperture and Slit Height

Changing the Slit Width
Turn the slit width control knob (35) and the slit width will be changed from 0 to 9mm. The slit becomes a circle at 9mm. The approximate width is indicated by the scale on the knob.

Changing the Aperture and Slit Height
Turn the aperture and slit height control knob (29) and six different circular beams of light are available at full aperture: 9, 8, 5, 3, 1, and 0.2 mm diameter. With a slit image, the slit height can be changed continuously from 1mm to 9mm, which is indicated through the display window (27).

Rotating the Slit Image
Swing the aperture and slit height control knob (29) horizontally to revolve the slit image at any angle in the vertical or horizontal direction. The angle of image rotation is indicated by the rotation angle scale with small division of 5° and big division of 10°.

Deflecting the Illumination Light
Loosen the centering knob (34) and swing the slit width control knob (35) back and forth so the light spot moves away from the center of the microscope vision field. It is mainly used to

examine the eyes by indirect retroillumination. Fasten the centering knob and the slit light will return to the center of the microscope vision field (Fig. 12).

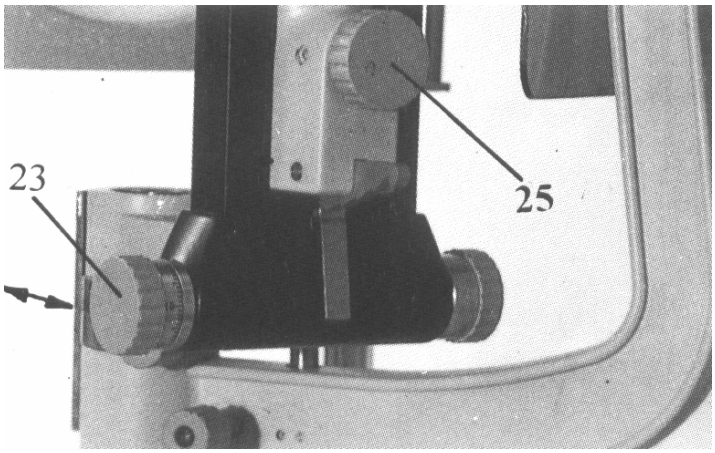

Figure 12

Oblique Illumination

This is used for sectional or fundus examination by using a contact lens. Press down the inclination lever (36) so that the illumination part inclines to 20° (5° of each division). Since the illumination part may touch the patient's head, operate carefully (Fig. 13).

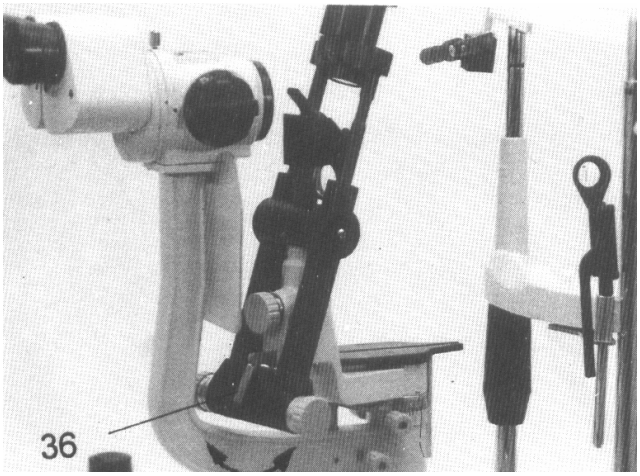

Figure 13

Reflecting Mirror

Both short and long reflecting mirrors are included with this slit lamp. Use the long mirror in normal examination. When the angle between the illumination part and the microscope is within 3° to 10°, the examined imaged might be obstructed. In this case, use the short mirror. The short mirror is also used when the illumination part is inclined over 10°.

Filter Selection
Turn the filter selection lever (28) in the horizontal surface to add four different kinds of filters respectively into the illumination pathway. Usually the heat-absorbing filter is used so that the patient may feel more comfortable during long periods of examination (Fig. 14).

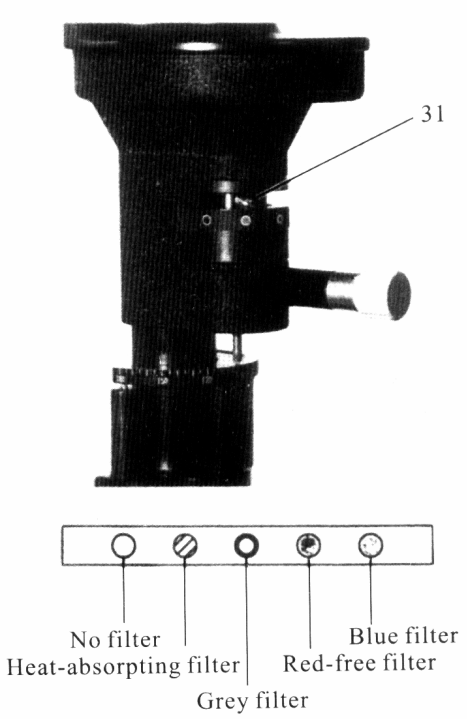

Figure 14

Fundus Observation with Hruby Lens
During routine usage, observation with the slit lamp is limited within the range from the cornea to the anterior portion of the vitreous body, owing to refraction effects of the cornea and the crystalline lens. With the Hruby lens in front of the microscope, the posterior part of the vitreous body and fundus then can be observed.

Examination Procedure with Hruby Lens:

1. The pupil should be dilated for approximately twenty minutes.
2. Insert the Hruby lens guide plate (15) into the main shaft hole of the illumination and the microscope arm.
3. Pull out the Hruby lens holder from one side of the headrest. Move the Hruby lens holder toward the operator so that it can slide freely to the left and right below the chin rest. Insert the lower end of the Hruby lens lever into the groove on the guide plate.
4. Move the focus of the illumination light and the microscope to the patient's eye.
5. Move the lever to locate the Hruby lens at the center of the visual field and near the patient's eye.
6. Move the lever to focus the Hruby lens at the fundus, then adjust the slit height and width to reduce the unnecessary light in the vision field.

7. To examine different views, either turn the microscope and the illumination arm or change the patient's fixation by manipulating the fixation target.
8. If the long mirror interferes in the examination, replace it with the short mirror.
9. After examination, move the Hruby lens back to the original position on one side of the chin rest.

ATTENTION! Before moving the Hruby lens to the right and left, first have the patient move his head away from the chin rest to avoid hitting the patient's nose with the Hruby lens.

MAINTENANCE

ATTENTION! The replaced waste materials should be treated as industrial waste.

Replacing the Illumination Bulb

Turn the main power switch (8) off. Pull out the plug connected to the lamp house. Rotate the lamp cap (26) counter clockwise and pull it out from the illumination part (A). Take out the old bulb and replace it. The groove in the bulb fixation disc should be aimed at the flange of the lamp base; otherwise the illumination may be uneven (Fig. 15). Place the lamp cap in the original position and rotate it clockwise. Then insert the connecting plugs. Turn on the main power switch and assure that the new bulb works.

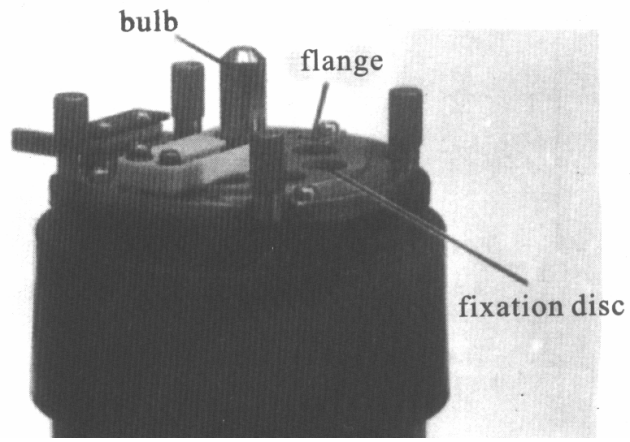

Figure 15

ATTENTION! The old bulb is hot.

Replacing the Reflecting Mirror

Set the angle between the microscope and the illumination arm to exceed 30°. Incline the illumination arm by more than 10°. Remove the long mirror by holding the extended surface. Insert a new long or short reflecting mirror. When replacing the short mirror, push the bottom of the mirror by using an object with a sharp end (Fig. 16).

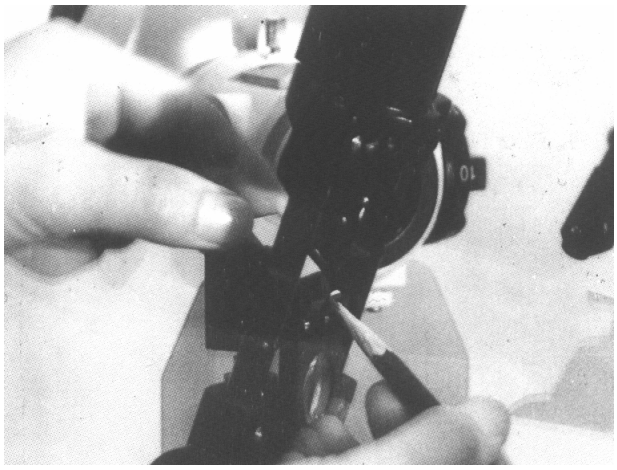

Figure 16

Replacing the Fuse

Turn off the main power switch (8) and pull out the input cable from the power socket. Screw off the fuse holder cover with the screwdriver (X). Replace it with a new fuse and then fasten the cover. The fuse specifications are as follows:

110V	1A, 250V
220v	0.5A, 250V

ATTENTION! Please select the fuse of the same type, specification, and rating.

Replacing Chin Rest Paper

When the paper needs replenished, pull upwards on the two fixing pins of the chin rest and place a new package of paper. Then secure the fixing pins again.

Adjusting the Tightness of the Slit Width Knob

If the slit width control knob is too loose, the slit width may be out of control. Loosen the screw on the right knob with the screwdriver (W), and then hold the left knob firmly with one hand, while the other hand rotates the right knob clockwise to adjust its tightness. When it is appropriate, fasten the screw of the right knob firmly again.

Adjusting the Inclination of the Illumination Part

If the inclination mechanism of the illumination part is too loose, fasten the screws on both sides of the pivot point with the screwdriver (U).

Cleaning

1. Cleaning the lenses and mirrors
   If any dust sticks on the lenses or reflecting mirrors, brush them with the brush (S) supplied with the slit lamp. In case any dust still remains, wipe it off with a soft cotton dipped with absolute alcohol.

   ATTENTION! Never scratch with fingers or any other hard materials.

2. Cleaning the slide plate, rail, and shaft
   If the slide plate, rail, and shaft are dirty, the vertical and horizontal movement will be unsteady. Wipe them with a clean soft cloth.

3. Cleaning and sterilizing plastic parts
   Clean the plastic parts such as chin rest bracket, headrest belt, etc. with a soft cloth dipped in a soluble detergent or water. Sterilize with medicinal alcohol.

   ATTENTION! Do not wipe with any corrosive detergent or the surface may be damaged.

Protecting

Dust will settle into the main shaft hole of the illumination arm during operation unless the hole is covered. Please cover the main shaft hole with the protection cap in order to keep the instrument clean. Remove the cap when the guide plate needs to be assembled (Fig. 17).

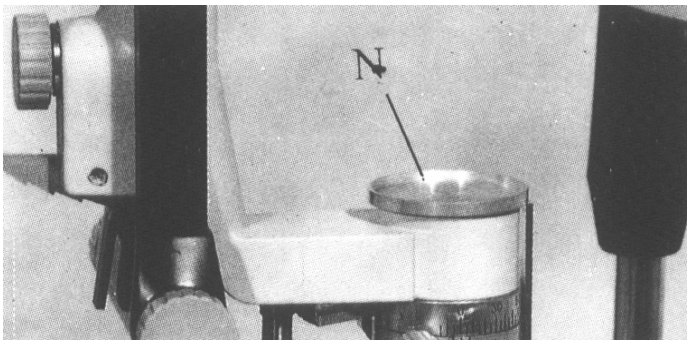

Figure 17

TROUBLESHOOTING GUIDE

In case of a problem with the slit lamp, please consult the following guide. If it still does not work, contact an authorized repairperson.

Problem	Possible Cause	Solution	Page
No Illumination	The cable is not connected correctly with the power socket.	Connect the power cable correctly.	10
	The main power switch is on 'O' position.	Place the switch on 'I' position.	10
	The plug on the power box is loose.	Insert the plug firmly.	10
	The plug on the lamp cap is loose.	Insert the plug firmly.	9
	The bulb has burnt out.	Change the bulb.	16
	The fuse has blown.	Change the fuse.	17
Slit is Too Dark	The bulb is not assembled properly.	Assemble the bulb properly.	16
	The filter lever is in the middle or in the grey filter position.	Set the filter lever to the correct position.	15
	Voltage selector is wrongly set.	Set the voltage selector correctly.	7
	The reflecting mirror coating is oxidized.	Change the reflecting mirror.	16
	Too much dust is on the reflecting surface.	Clean the surface with the brush.	17
Fuse has Blown	Voltage selector is wrongly set.	Set the voltage selector properly.	7
	The fuse doesn't match specifications.	Replace it with the proper fuse.	17
Slit Closes Automatically	The slit width control knob is too loose.	Adjust the tightness of the control knob.	17
Fixation Target is Off	The output plug is loose.	Insert the output plug firmly.	10

TRANSPORTATION AND STORAGE

During the transportation of the slit lamp, be careful to protect it from liquids, avoid vibrations, and do not turn it upside down. The relative humidity should be 10% to 90% and the environment temperature should be -25°C to 40°C.

This instrument should be stored in a well-ventilated room without corrosive gas. The relative humidity should be 10% to 80% and the environment temperature should be -10°C to 40°C. If the assembled instrument should be moved or transported a short distance, ensure that all movable parts are locked. Move this instrument carefully by carrying on it table. If long transportation is required, the slit lamp should be repacked in the original packaging.

SPECIFICATIONS

Microscope

Type	Parallel Optics				
Model of Magnifying	5 Steps by Drum Rotation				
Eyepiece	12.5x				
Total Magnification Rate	6x Ø33mm	10x Ø22.5mm	16x Ø14mm	25x Ø8.8mm	40x Ø5.5mm
Range of PD Adjustment	55mm to 75mm				
Diopter Adjustment	-5D to +3D				

Illumination

Slit Projection Magnification	2/3x
Slit Width	Continuous from 0mm to 9mm (at 9mm, slit becomes circle)
Slit Height	∅9mm, ∅8mm, ∅5mm, ∅3mm, ∅2mm, ∅1mm, ∅0.2mm
Slit Angle	0° to 180° continuously, adjustable from vertical to horizontal
Slit Inclination	5°, 10°, 15°, 20° in four steps
Filters	Heat-absorbing, Grey, Red-free, Blue
Illumination Bulb	12V / 30W halogen bulb (BT-6705 from Amcon)

Movement Base

Longitudinal Movement	90mm
Lateral Movement	100mm
Fine Base Movement	15mm
Vertical Movement	30mm

Chin Rest

Vertical Movement	80mm
Fixation Target	Red LED

Hruby Lens

Hruby Lens	-58.7D

Power Source

Input Voltage	100/220V ~ ± 10%
Input Frequency	50/60 Hz
Power Consumption	58 VA
Output Voltage	Illumination Bulb 7.2v, 9.8V, 11.6V Fixation Target 7.2V
Electric Safety Standard	Conforms to Standard IEC601-1, Class I Type B

Dimension and Weight

Packing Box	720mm x 495mm x 480mm
Total Weight	24 kg
Net Weight	21 kg

Subject to change in design or specifications without advance notice.